

Application No. 10/087,566

REMARKS

Claims 1-24 are pending. By this Amendment, claims 1-24 are canceled and new claims 25-72 are added.

The drawings were objected to because it was asserted that Figure 1 illustrates only that which is old. Figure 1 has been amended to include the legend --Prior Art--.

Claims 13 – 24 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 were rejected under 35 U.S.C. § 102(e) as being anticipated by Copetti et al. Claims 1 – 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hirose et al. in view of Boutin et al.

Claims 1 – 24 have been canceled. New claim 25 generally corresponds to original claim 1 and is directed to an “insulating substrate board for a semiconductor comprising a ceramic substrate board and a metal alloy layer consisting mainly of aluminum bonded by direct bonding on at least one surface portion of the ceramic substrate board ,” in cooperation with the other claimed elements. New claim 37 also generally corresponds to original claim 1, wherein the aluminum is “bonded by direct bonding a brazing material layer on at least one surface portion of the ceramic substrate board,” in cooperation with the other claimed elements.

New claim 49 generally corresponds to original claim 13 and is directed to a “power module comprising a ceramic substrate board, metal alloy layers consisting mainly of aluminum bonded directly on both surfaces of the ceramic substrate board, a metal base plate bonded to one of the metal alloy layers, and a semiconductor tip,” in cooperation with the other claimed elements. New claim 61 also generally corresponds to original claim 13, wherein the metal alloy layers consist “mainly of aluminum bonded through a brazing material on both surface of the ceramic substrate board,” in cooperation with the other claimed elements.

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The cited references do not teach or suggest the invention claimed in new claims 25, 37, 49, and 61. One object of the present invention is to protect against thermal shock and cracking in the substrate and layers so as to enhance the heat cycle properties of a ceramic substrate. The Applicant respectfully disagrees with the assertion that since Copetti, and Hirose and Boutin, disclose a module having the same structure as presently claimed, the same structure will inherently have the same properties as claimed, such as having the Vickers hardness of not less than 25 and not more than 40. The Vickers hardness of such alloys may vary according to the processes of hardening even if the compositions are the same.

New claim 25 claims "a metal alloy layer consisting mainly of aluminum *bonded directly on* at least one surface portion of the ceramic substrate board," and new claim 49 claims "metal alloy layers consisting mainly of aluminum *bonded directly on* both surfaces of the ceramic substrate board," in cooperation with the Vickers hardness of "not less than 25 and not more than 40" and the other claimed elements. New claim 37 claims "a metal alloy layer consisting mainly of aluminum *bonded through a brazing material layer*," and new claim 61 claims "metal alloy layers consisting mainly of aluminum *bonded through a brazing material*," in cooperation with the Vickers hardness of "not less than 25 and not more than 40" and the other claimed elements.

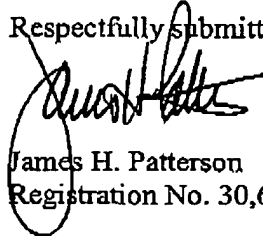
Therefore, new claims 25, 37, 49, and 61 are believed to be allowable. New claims 26 – 36, 38 – 48, 50 – 60, and 62 – 72 depend from claims 25, 37, 49, and 61 and are allowable at least for the reasons above.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

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The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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